2020 Secretary of Defense

Environmental Awards

Environmental Restoration, Individual/Team
Hill Air Force Base Environmental Restoration Team

Introduction

Hill Air Force Base (AFB) is an Air Force Materiel Command base located in northern Utah. It is the Air Force's second largest base by population and geographical size and is home to many operational and support missions. Hill AFB maintains over 700 aircraft including F-22 Raptors, F-35A Lightning IIs, F-16 Fighting Falcons, A-10 Thunderbolt IIs, C-130s, and Minuteman 3 missiles. Hill AFB is also the largest single-site employer in the State of Utah, with an economic impact of more than $3 billion annually.

The host organization at Hill AFB is the 75th Air Base Wing (ABW). The 75 ABW oversees one million acres and more than 1,700 facilities valued at $4 billion while providing installation support for the Ogden Air Logistics Complex, Air Force Life Cycle Management Center, Air Force Nuclear Weapons Center, Air Force Active Duty 388th and Reserve 419th Fighter Wings, and more than 50 mission partners that employ over 21,000 personnel.

Hill AFB also has support responsibility for the operation of the Utah Test and Training Range (UTTR) and Wendover Auxiliary Field in Nevada. Located in Utah's west desert, the airspace is situated over 2.3 million acres of land and contains the largest block of overland contiguous restricted military airspace in the continental United States.

F-35A Lightning II
Hill AFB is home to the 388th and 419th Fighter Wings. This photo depicts F-35A Lightning II fighter jets over the Great Salt Lake, Utah.

Background

Hill AFB has been an active military base and maintenance depot since the early 1940s. Historical waste handling and disposal practices coupled with other industrial processes have resulted in numerous contaminant releases. Most of the releases consist of chlorinated solvents and metals. Plumes extend into seven communities surrounding the Installation. Approximately 1,200 acres of off-base commercial and residential property have been affected by the contamination, with most of this acreage in densely populated areas. The Installation was placed on the Comprehensive Environmental Response, Compensation, and Liability Act's (CERCLA) National Priorities List otherwise known as "Superfund," in July 1987. In 1989 a Federal Facility Agreement was signed by Hill AFB, the United States Environmental Protection Agency (EPA) Region 8, and the Utah Department of Environmental Quality (UDEQ).

The Hill AFB Environmental Restoration Team (Team) manages its Environmental Restoration Program with the philosophy of cost-efficiency, while at the same time meeting Air Force mission objectives and promoting environmental stewardship.

The Team includes:

- Mark Roginske, Restoration Program Manager
- Elizabeth Tevault, Restoration Program Manager
- Jason Wilde, Restoration Project Manager
- Lewis Bowers, Restoration Project Manager
- Lindsay Burt, Restoration Project Manager
- Peifen Tamashiro, Restoration Project Manager

Hill AFB Environmental Restoration Team
The Hill AFB Environmental Restoration Team managed 125 environmental cleanup sites by partnering with key stakeholders. Federal, state, and local partnerships are essential to goal achievement.

Position Description

Key Environmental Restoration objectives include: protecting human health and the environment; conducting all Environmental Restoration activities in compliance with the law; facilitating partnerships with researchers and vendors to demonstrate technologies that will improve cleanup efficiency and reduce costs; implementing early cleanup actions when appropriate; and optimizing the performance of remedial systems and closing sites as soon as practicable. Hill Team success can be directly attributed to innovative program management, an extremely high level of technical expertise, regulatory partnerships, and stakeholder involvement.

Summary of Accomplishments

Accelerated Environmental Cleanup

Under two Environmental Restoration contracts that totaled over $110 million, spanned 10 years, and covered 125 environmental cleanup sites, the Hill Team made substantial progress toward reaching Air Force cleanup goals. Using innovative technology, aggressive project management, and partnership with regulators and stakeholders, Hill completed seven Records of Decision, reached Response Complete at 10 sites, and Site Closure at another 12 sites.

Magnesium/Thorium Removal at Hill AFB's Little Mountain Test Facility

Hill AFB removed 5,500 tons of radioactive soil contamination. Over two acres of unusable land were returned for mission-ready use.

The Team expertly maneuvered through the complicated Nuclear Regulatory Commission process to close a 60-year old Magnesium-Thorium disposal site located in the southeastern corner of the Little Mountain Test Facility (LMTF), located approximately 15 miles northwest of Hill AFB and adjacent to the Great Salt Lake. Investigations were performed to refine the nature and extent of the poorly delineated radiological contamination in soil resulting in the excavation and disposal of over 5,500 tons of radioactive material. Over two acres of unusable land were returned to mission-ready status saving over $10,000 per year in inspection and permitting fees.

The Team used a multi-component approach to accelerate cleanup at a former gas station site which is the source of co-mingled solvents and soluble and insoluble petroleum contamination to the groundwater. Near the contamination source, over four pounds of insoluble petroleum products were physically removed from the groundwater surface using bailing techniques during the last two operating years. To address the soluble solvent and petroleum contamination at the source, a soil vapor extraction system was continuously operated to remove over 260 pounds of volatile organic compounds during the same time period. At the core of a faster-moving soluble fuel additive called Methyl Tert-Butyl Ether groundwater contaminant, a pump-and-treat/air stripper system was also operated to remove over 90 pounds of the fuel additive contaminant. This active treatment combination has reduced site remedial timeframes by 10 to 40 years over natural contaminant breakdown, depending on the contaminant.

Innovative Technology Demonstration, Validation, and Implementation

Hill AFB has two remote sites located on LMTF. One site call Former Tank Farm had more than 1,824 tons of petroleum-impacted soil removed from the source area. A treatability study was initiated to address areas of the site where petroleum-impacted soil and groundwater are more dispersed. 118 temporary injection points and 48 temporary extraction points were installed at the site. 24,425 gallons of a Chemically Oxygenated Granular Activated Carbon (COGAC) solution were injected. In the COGAC injection process more than 21,687 gallons of impacted groundwater were removed.

The second site at LMTF operated a passive soil vapor extraction system until July 2017 when the system was upgraded to a remote solar

power assisted system. The upgrade removed 25 times more volatile organic compound mass and accelerated cleanup in the source area.

Former Tank Farm Restoration at Hill AFB's Little Mountain Test Facility

More than 1,824 tons of petroleum-impacted soil were removed from the Former Tank Farm at Hill AFB's Little Mountain Test facility. A treatability study was initiated to address portions of the site.

The Hill Team is working to reduce a groundwater plume originating from a former vehicle maintenance building which is now part of the base golf course. Treatment included installation of a bioreactor made of gravel, mulch, and pyrite as well as two rows of injection wells to inject vegetable oil for enhanced bioremediation. A down gradient extraction well was used to add water to the top of the well and percolate down through the bioreactor to bolster reducing conditions in the contaminated aquifer.

The bioreactor functioned as intended during the first two years following installation, but in 2017 the extraction well stopped producing due to biofouling. After attempts to re-develop the well failed, a unique solution was identified. A culinary water line was connected to the bioreactor making a once stalled-out treatment method effective again. Although no longer treating contaminated water in the bioreactor, the potable water carries carbon which enhances bioremediation of contaminants in both the soil and groundwater.

The Team used Geographic Information Systems (GIS) to eliminate monitoring well redundancy while continuing to accurately assess groundwater quality. An initial groundwater contaminant plume map was generated using several monitoring wells. The wells were then interactively reduced until similar plume maps were produced using smaller sets of wells. Through this process, the Hill Team, with the approval of the state and Federal regulators, was able to reduce the number of monitoring wells sampled in a year by 600 and the number of samples collected by 3,100, saving over $2.5 million.

Partnerships Addressing Environmental Restoration Issues

The Hill Team masterfully managed 125 environmental cleanup sites by partnering with key stakeholders. In addition to EPA and UDEQ, Hill coordinated with the Bureau of Land Management (BLM), State of Utah School and Institutional Trust Lands Administration, Nevada Division of Environmental Protection, Central Weber Sewer Improvement District, North Davis County Sewer District, Weber County Health Department, Davis County Health Department, and surrounding communities. The successful coordination with these Federal, state, and local agencies is essential in communicating and achieving Air Force remediation goals at Hill AFB.

The Team briefs site cleanup progress to regulators weekly, Restoration Advisory Board (RAB) members quarterly, and city council members annually. In addition, they provided three restoration site tours to city leaders, RAB members, and regulators. Three public meetings were also provided to obtain public input on proposed site cleanup remedies. Public engagement has created a strong sense of trust between the public and Hill AFB.

For the UTTR, stakeholder meetings include biannual RAB and remedial project manager meetings and monthly Military Munitions Response Program (MMRP) meetings. Stakeholder meetings also include range safety training, MMRP quality assurance panels, and meetings to discuss any site issues or questions that arise throughout the year. Stakeholder meetings are used to resolve conflict quickly and before larger issues arise. The constant communication has led to improved relationships with regulators and landowners, and successful completion of Air Force goals.

The Team's proactive community outreach program provided significant payback to the Environmental Restoration Program. When the regulatory agencies proposed deed restrictions for un-sampled off-base homes impacted by groundwater contamination, they jumped into action. The Team partnered with city leaders from five surrounding communities, firefighters, county health departments, RAB members, and key regulators to personally visit 900 homes and sign up over 400 locations for sampling in just two evenings. The regulatory agencies were so impressed by this outreach effort that they changed their stance on the need for residential deed restrictions, saving property owners from unnecessary anguish and potential property value impacts.

The Team's reputation for partnering with stakeholders to assist in implementation of remedial solutions caught the attention of the highly respected Interstate Technology and Regulatory Council Board of Advisors, a National regulatory-led coalition, who requested a tour of Hill AFB restoration sites as part of their annual meeting. In a thank you note following the tour, the Council director wrote, "*It was especially useful to hear about how you partner with the nearby communities to inform them of any potential contamination and set up testing devices in their homes. From our work, we see how important risk communication is, so it was exciting to see it in action*."

Indoor Air Sampling in Off-Base Residence
An indoor air sampling device is placed in an off-base residence impacted by groundwater contamination. The resident was one of 400 locations who agreed to sample during a door-to-door outreach effort.

A 660-foot long underground permeable reactive barrier groundwater treatment system was installed along a former railroad easement in a neighboring community to Hill AFB. The location is a naturally low spot. During periods of high precipitation, stormwater began to pond in neighboring backyards. The Team immediately sampled the ponding stormwater, determined that it had co-mingled with contaminated groundwater, and coordinated a plan with the impacted neighbors to prevent immediate exposure and provide a long-term solution to prevent future ponding stormwater. They worked directly with impacted neighbors to raise the elevation of their backyards and create a gravel-filled channel along the barrier to allow water to drain away from the yards. The successful project removed an exposure pathway, reduced Air Force liability, and

fostered a positive relationship with affected residents and surrounding neighbors.

The Hill AFB Civil Engineer Group contacted the Hill Team for direction on what should be done with 57,000 cubic yards of soil that was being removed from a runway construction project. The team provided a soil sampling plan which determine the soil to be uncontaminated. The base landfill and local landfill were able to accept the soil at no cost. This partnering action saved Hill AFB $550,000 in soil disposal costs.

Reducing Risk to Human Health and the Environment

A Time-Critical Removal Action (TCRA), which is an emergency action to remove an immediate threat to human health and the environment, was initiated in 2019 for asbestos abatement. Within a controlled area on Hill AFB, asbestos-containing material (ACM) was discovered across eight acres of a grassy field. The ACM was from old demolished buildings. When first identified in 2014, human exposure was considered under control as the asbestos is in a non-friable form and access is already controlled by a security fence.

In September 2018, it came to the attention of the Hill Team that the area was being mowed at least quarterly during growing seasons. A lawn-mower blade striking ACM could potentially send asbestos fibers airborne increasing the human health risk to any onsite workers. Maintenance workers were instructed not to mow the area until further notice, effectively removing them from the health hazard. A quick solution was needed as fire and security regulations mandate that the grass be cut, so the TCRA was implemented. Approximately 100 cubic yards of ACM is being removed by certified asbestos contractors and in the spring of 2020, the area will be covered by 12 inches of clean fill acting as a cap for any remaining soil contamination. The Hill Team was able to secure use of 8,100 cubic yards of clean fill from the runway construction project, saving the Air Force $275,000.

The Team finalized remedial investigations on three munitions response sites located next to the UTTR and situated on BLM and School and Institutional Trust Lands Administration property. The three sites total 12,545 acres of publicly accessible land. As a result of the investigations, no further action is necessary for 8,394 of the total acreage, eliminating risk to human health and the environment on these public lands. The remaining acreage will be evaluated for further remedial actions and/or restrictions.

The Team closed four munitions response sites declaring that no additional actions are warranted at the sites because previous investigations and removal actions have eliminated the need for further actions. The level of potential contaminants or munitions hazards have been reduced to levels that allow for unlimited use and unrestricted exposure. The closure of these sites has removed a significant danger to public and Air Force personnel safety on 575 acres.

Landfill 5 is a closed hazardous waste landfill located on the UTTR that operated from 1976 to 1983. Seven unlined landfill cells reportedly received over 12,800 tons of hazardous waste generated at Hill AFB. Soil and groundwater sampling results indicate that contaminants have leached from the landfill and contaminated the underlying vadose zone and groundwater. In order to eliminate this ongoing contamination, all seven cells of the landfill were excavated. Over 30,000 tons of highly contaminated source material and soil were removed from the cells and disposed of at an approved landfill or incinerator. This removal action eliminated further risk to the environment and resulted in a realized cost savings of over $20 million in future operations and maintenance actions.

Two site restorations were completed at the UTTR. One site was used to accumulate debris from range activities. The other site was used to consolidate construction and demolition debris. Both sites were contaminated with asbestos and metals. Over 10,000 tons of waste and impacted soil were removed from the two sites and disposed of at an approved landfill. These removal actions eliminated risk to human health and the environment and returned 18 acres of land back to a mission-ready status.

Green Remediation

Hill AFB practices green remediation. Six restoration site groundwater extraction and treatment systems were optimized by converting active pumping systems to gravity drain systems, installing new digital thermostats in metering buildings for smart heating controls in the winter months, and right sizing the pumps for tasks. Through these optimization practices, over 138,000 kWh of energy and over $12,000 was saved during the last two operating years. In addition, a restoration site bioreactor used to treat contaminants through a groundwater recirculation system is operating using 100% solar energy, which results in zero energy costs to the Air Force.

At the UTTR, five regulatory-required annual site inspections for 85 active CERCLA and Resource Conservation and Recovery Act locations spread out over one million acres of Air Force property were combined into one site inspection, resulting in a reduction of time in the field by one week and a cost savings of over $10,000 in wages, equipment, and gasoline.

Utah Test and Training Range Landfill 5 Hazardous Waste Removal

Hill AFB removed 12,800 tons of hazardous waste from Landfill 5, a closed hazardous waste landfill located of the Utah Test and Training Range. The action eliminated future risk to the environment and saved future operations and maintenance costs.